

Amendments to the Drawings:

Please substitute the enclosed corrected sheet 1/3 of the drawings, identified in the upper right corner as "Replacement Sheet," for the sheet 1/3 of the drawings currently on file. The drawings have been corrected to include the reference numbers 90, 91, 92, 93, 200, 201, 202, 203 and 210; to correct the placement of the lead line for the element 33; and to improve the quality of the drawing of the O-ring/seal 33 to meet the Examiner's objections. The extraneous penciled-in illustration at the bottom right side of Fig. 1 has also been removed.

Attachment: Replacement Drawing Sheet 1/3

REMARKS

By the foregoing Amendment, Claims 3, 4, 12, 13 and 20 to 31 have been cancelled, and Claims 1, 2, 5, 7, 8, 14, 16 and 17 have been amended. Favorable reconsideration of the application is respectfully requested.

The Examiner object to the drawings as not including the reference numbers 90, 91, 92, 93, 200, 201, 202, 203 and 210, to the placement of the lead line for the seal 33, to the quality of the drawing of the O-ring/seal 33, and to the penciled-in illustration at the bottom right side of Fig. 1. Fig. 1 has been corrected to meet the Examiner's objections, and it is accordingly believed that the objections to the drawings can be withdrawn.

Claims 13, 14, 16, 17, 22, 23, 28 and 29 were rejected under 35 U.S.C. §112, second paragraph, on the grounds of indefiniteness. Claims 13, 22, 23, 28 and 29 have been cancelled. Applicant wishes to thank the Examiner for pointing out the inconsistencies in claims 14, 16 and 17 which have been corrected by amendment; the Examiner's objections were well taken. Claims 14, 16 and 17 have been corrected in accordance with the Examiner's suggestions, so that it is believed that the rejection of Claims 13, 14, 16, 17, 22, 23, 28 and 29 on the grounds of indefiniteness can be withdrawn.

Claims 1-2, 7, 8, 16 and 17 were rejected under 35 U.S.C. §102(b) on the grounds of anticipation by Moretti (GB 2 008 230 A). Claims 1 and 2 have been amended to recite "the valve housing has a pair of spaced apart valve seat surfaces, a first valve seat surface which is engageable by a first annular end surface of the tubular sleeve and a

second valve seat surface which is engageable by a second annular end surface of the tubular sleeve," "the tubular sleeve is connected by a rod to an armature located outside the valve chamber, the armature being located within an electrical coil also located outside the valve chamber; the spring means comprises a spring which acts between a spring seat provided in the valve housing and a spring seat fixed to the exterior of the sleeve; and the only forces applied to the rod are forces which place the rod in tension, the spring acting to move the sleeve into engagement with the first valve seat surface."

It is respectfully submitted that Claims 1-2, 7, 8, 16 and 17 patentably distinguish Moretti in having the following features:

- a) "*a first annular end surface*" which engages the first valve seat surface - in Moretti, the end surfaces of the sleeve valve do not engage anything, instead the end parts of the sleeve valve extend into bores at both ends of the valve chamber;
- b) "*a second annular end surface*" which engages the second valve seat surface - in Moretti the end surfaces of the sleeve valve do not engage anything, instead the end parts of the sleeve valves extend into bores at both ends of the valve chamber.
- c) a rod connecting the tubular sleeve to an armature located outside of the valve chamber - in Moretti the stem 36 can abut the core 18, but is not connected to it;
- d) "*a spring seat fixed to the exterior of the sleeve*" - in Moretti the spring 38 is internal of the sleeve and acts on the stem 36;
- e) a rod placed solely in tension - in Moretti the core 18 of the electromagnet applies a compressive force on the stem 36.

It is therefore respectfully submitted that the rejection of Claims 1-2, 7, 8, 16 and 17 on the grounds of anticipation from Moretti should be withdrawn.

Claims 3, 5, 12 and 14 were rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Moretti in view of Brehm et al. Claim 3 has been cancelled. Brehm does not disclose the novel features b), d), e) noted above, and so a combination of Moretti and Brehm would not arrive at the claimed invention. The sleeve 12 of Brehm does have one sealing annular end surface which seals against the valve seat 35, but it does not have a second annular end sealing surface - the second sealing surface which seals with seal 33, is provided at the same end of the sleeve 12 as the first sealing surface. The spring 30 is internal of the sleeve, not external as now claimed. More importantly, when the electric motor 13 of Brehm is energised then it "*presses through the plunger 17 against the valve body 12*" (column 3, lines 3-6). Thus it applies a compressive force. The present invention, on the other hand, solves the technical problem of advantageously using a slender rod, since the rod is placed only in tension. It is therefore respectfully submitted that the rejection of Claims 3, 5, 12 and 14 on the grounds of obviousness from Moretti in view of Brehm et al. should be withdrawn.

Claims 4 and 13 were rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Moretti in view of Roth et al. Claim 4 has been cancelled. The most relevant embodiment of Roth et al is the second embodiment of Figure 2 (Figure 1 of Roth et al has just one inlet port and one outlet port). The Figure 2 embodiment does not have a "*tubular sleeve having a tubular passage therethrough*" through which flow flows to the third fluid conduit; in Roth there is a cap 112 which closes the tubular passage and

so fluid cannot flow through it to the third fluid conduit (107). Roth is either manually operated (Figure 1) or by compressed gas supplied via bore 126 (Figure 2). It has no electrical coil, nor a rod connecting the sleeve to such a coil. Thus it does not have either of novel features c) or e) mentioned above. It is therefore respectfully submitted that the rejection of Claims 4 and 13 on the grounds of obviousness from Moretti in view of Roth et al. should be withdrawn.

Claims 6 and 15 were rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Moretti in view of Aumayer. Aumayer does not have novel features d) or e) described above. In Aumayer the springs (44 in Figure 2 and 84, 85 in Figure 7) do not act directly on the sleeve 33, but act via the rods 36, 82. The rods are subject to compressive forces and must be stiff enough to resist bending or other distortion. Aumayer, like Moretti and Brehms, teaches away from the present invention. It is therefore respectfully submitted that the rejection of Claims 6 and 15 on the grounds of obviousness from Moretti in view of Aumayer should be withdrawn.

Claims 9 and 18 were rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Moretti in view of Tomlin et al. Tomlin et al, like Aumayer, does not have a spring which acts directly on the sleeve valve. Instead the springs 76, 78 (see Figure 2) act on the stem 62. The stem 62 is not acting as an electric coil; a pilot controlled piston 82 subjected to fluid pressure acts on it. Most importantly, the stem 62 is subjected to compressive force and hence must be thick in nature to avoid bending. Like the other prior art documents, this document does not disclose the inventive features of an arrangement which only ever places the connecting rod in tension. Tomlin et al

does not have either of the novel features d) and e) described above. It is therefore respectfully submitted that the rejection of Claims 9 and 18 on the grounds of obviousness from Moretti in view of Tomlin et al. should be withdrawn.

Claims 10, 19, 22, 23, 25, 28, 29 and 31 were rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Moretti in view of Mesenich. Claims 22, 23, 25, 28, 29 and 31 have been cancelled. Mesenich describes many embodiments. The embodiments of Figures 2 and 4 do not use a spring at all, but use hydraulic pressure. None of the embodiments have features c) and e) identified above. Mesenich does not teach having an armature located outside the valve chamber; instead the sleeve itself acts as an armature in all embodiments of Mesenich. Adopting the approach of Mesenich compromises the efficiency of the valve - it is better to optimise the coil/armature design by having them separate from the sleeve, which can itself be optimised in design. It is therefore respectfully submitted that the rejection of Claims 10, 19, 22, 23, 25, 28, 29 and 31 on the grounds of obviousness from Moretti in view of Mesenich should be withdrawn.

Claims 20 and 26 were rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Moretti in view of Brehm and further in view of Roth et al. Claims 20 and 26 have been cancelled.

Claims 21 and 27 were rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Moretti in view of Mesenich and further in view of Aumayer. Claims 21 and 27 have been cancelled.

Claims 24 and 30 were rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Moretti in view of Mesenich and further in view of Tomlin et al. Claims 24 and 30 have been cancelled.

Considering all the cited references taken together in combination, it is respectfully submitted that none of the cited references have the feature e) identified above, and therefore combining them all could not lead to the presently claimed invention. Besides, many of the designs are incompatible with others and teach in different directions. Most importantly, all of the prior art references which both have an armature and coil outside the valve chamber and also use a spring to provide a biasing force apply the biasing spring force via the connecting rod.

In light of the foregoing amendments and remarks, it is respectfully submitted that the application should now be in condition for allowance, and an early favorable action in this regard is respectfully requested.

The Commissioner is authorized to charge any deficiencies or fees in connection with this amendment to Deposit Account No. 06-2425.

Respectfully submitted,

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JWP/eab

Encl.: Corrected drawing sheet 1/3

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